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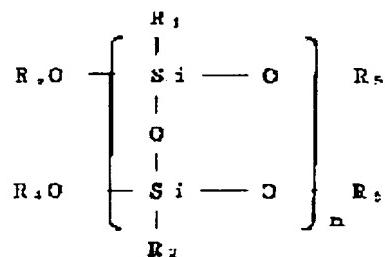
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## 54) PHOTOSENSITIVE SILICONE LADDER POLYMER COMPOSITION AND METHOD FOR TRANSFERRING PATTERN TO THIS COMPOSITION AND SEMICONDUCTOR DEVICE USING THIS COMPOSITION

57)Abstract:

PROBLEM TO BE SOLVED: To enable microfabrication by direct light by incorporating the specified silicone ladder polymer and a photosensitive cross-linking agent or a photopolymerization initiator.

SOLUTION: The photosensitive silicone ladder polymer composition comprises the cross-linking agent or a photopolymerization initiator, and the silicone ladder polymer represented by the formula in which each of R1 and R2 is, independently, an H atom or an aryl or alkyl or functional group having an unsaturated bond; each of R3-R6 is, independently, an H atom or an aryl or alkyl or trialkylsilyl or functional group having an unsaturated bond; some of R1-R6 is an amount of &gt;1 weight% of them is a photosensitive functional group; and (n) is a natural number. This photosensitive silicone ladder polymer composition comprises this ladder polymer and the photosensitive cross-linking agent or the photopolymerization initiator, and therefore, it is insolubilized in solvents and made possible to be microfabricated by direct light.



## JURIDICAL STATUS

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\*\*\*\* shows the word which can not be translated.

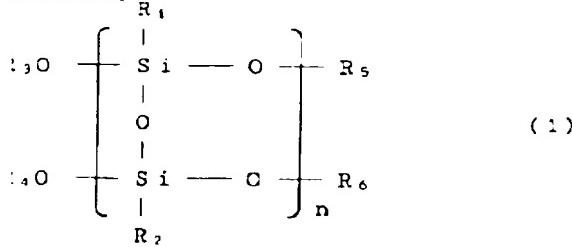
In the drawings, any words are not translated.

## CLAIMS

Claim(s)]

Claim 1] The following general formula (1)

Formula 1]



Among a formula, R1 and R2 may be a functional group which has an aryl group, a hydrogen atom, an aliphatic alkyl group, or a unsaturated bond, nd even if they are of the same kind, different species are sufficient as them.) R3, R4, R5, and R6 may be a functional group which has a hydrogen tom, an aryl group, an aliphatic alkyl group, a trialkylsilyl group, or a unsaturated bond, and different species are sufficient as them even if they are f the same kind. However, it is the functional group which has photosensitivity one of R1, R2, R3, R4, R5, and R6% of the weight or more, and n is ne natural number. Photosensitive silicone ladder system resin constituent containing the silicone ladder system resin and the photosensitive cross nking agent which are expressed, or the photopolymerization initiator.

Claim 2] The photosensitive silicone ladder system resin constituent according to claim 1 with which the functional group which has a unsaturated ond is characterized by being an ARUKENIRU machine, an alkyl acryloyl machine, an alkyl methacryloyl machine, or a styrol machine.

Claim 3] The photosensitive silicone ladder system resin constituent according to claim 1 or 2 characterized by containing a photosensitive cross nking agent or a photopolymerization initiator 0.01 to 20% of the weight to a silicone ladder system resin.

Claim 4] The photosensitive silicone ladder system resin constituent according to claim 1 to 3 characterized by containing a photosensitizer or an ptical start assistant.

Claim 5] The photosensitive silicone ladder system resin constituent according to claim 4 characterized by containing a photosensitizer or an ptical start assistant 0.01 to 10% of the weight to a silicone ladder system resin.

Claim 6] The photosensitive silicone ladder system resin constituent according to claim 1 to 5 characterized by containing a polymerization hibitor.

Claim 7] The photosensitive silicone ladder system resin constituent according to claim 6 characterized by containing a polymerization inhibitor 10 ppm - 5% of the weight to a silicone ladder system resin.

Claim 8] The photosensitive silicone ladder system resin constituent according to claim 1 to 7 characterized by containing a silane coupling agent.

Claim 9] The photosensitive silicone ladder system resin constituent according to claim 8 characterized by containing a silane coupling agent 10 ppm - 10% of the weight to a silicone ladder system resin.

Claim 10] The photosensitive silicone ladder system resin constituent according to claim 1 to 9 characterized by containing a photopolymerization ature monomer or photopolymerization nature oligomer.

Claim 11] The photosensitive silicone ladder system resin constituent according to claim 10 characterized by containing a photopolymerization ature monomer or photopolymerization nature oligomer 10 ppm - 100% of the weight to a silicone ladder system resin.

Claim 12] The pattern imprint method of giving the process which develops the process which carries out stoving at 5-degree-C or more low emperature from the decomposition temperature of the process which forms the resin constituent film which contained the photosensitive silicone adder system resin constituent according to claim 1 to 11 in the substrate, a photosensitive cross linking agent, a photopolymerization initiator, a hotosensitizer, an optical start assistant, a polymerization inhibitor, a silane coupling agent, a photopolymerization nature monomer, or hotopolymerization nature oligomer, the process exposed using a photo mask, and the above-mentioned resin constituent film.

Claim 13] The pattern imprint method according to claim 12 characterized by using the substrate by which silane coupling processing was carried ut.

Claim 14] The pattern imprint method according to claim 12 or 13 characterized by exposing in an inert atmosphere.

Claim 15] The pattern imprint method according to claim 12 to 14 characterized by giving the process heated at 5-degree-C or more low emperature after exposure from the decomposition temperature of a photosensitive cross linking agent, a photopolymerization initiator, a hotosensitizer, an optical start assistant, a polymerization inhibitor, a silane coupling agent, a photopolymerization nature monomer, or hotopolymerization nature oligomer.

Claim 16] It is the pattern imprint method according to claim 12 to 15 characterized by performing development by giving etching and a rinse to a esin constituent film alternately with multiple times.

Claim 17] The semiconductor device equipped with the semiconductor substrate and the resin constituent film which consists of a photosensitive ilcone ladder system resin constituent according to claim 1 to 11 prepared in this semiconductor substrate.

Claim 18] The semiconductor device according to claim 17 which a resin constituent film is an insulator layer and is characterized by \*\*\*\*\*. the

stress buffer film, the passivation film ~~for the single grating film, 252826005008%3D%2522lightyellow%2522~~

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